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ABSTRACT

A study examined the effects of prior knowledge on the reading comprehension of disadvantaged first-grade students from an inner-city school in northern Utah. A thematic approach using trade books, field experiences, Language Experience Activities, and student journals was used to increase background knowledge of the at-risk first graders who were studied. The entire class participated in the field experiences and observations; four at-risk students from the group were selected for pre-trip and post-trip interviews. Qualitative research using observation, interviews, and journals was conducted in the classroom. Results showed deeper and richer prior knowledge and understanding in the post-trip interviews. Data gathered suggest that using field experiences and related activities can be a powerful way to extend prior knowledge, build schema, and make up experiential deficits in at-risk first-grade students. (Contains 72 references; appended are examples of various journal, observational, and question forms used in the study.) (Author/CR)

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ED 419 219

BUILDING THE PRIOR KNOWLEDGE OF DISADVANTAGED FIRST-GRADE STUDENTS THROUGH THE USE OF FIELD EXPERIENCES

by

Elizabeth Ann (Becky) Koldewyn

A project submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF EDUCATION
OF CURRICULUM AND INSTRUCTION

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Abstract

This project addressed the effects of prior knowledge on the reading comprehension of disadvantaged first-grade students. A thematic approach using trade books, field experiences, Language Experience Activities, and student journals was used to increase background knowledge of the at-risk first-graders who were studied. Qualitative research using observation, interviews, and journals was conducted in the author's classroom. The results of the study showed deeper and richer prior knowledge and understanding in the post-trip interviews. The data gathered in this study suggested that using field experiences and related activities can be a powerful way to extend prior knowledge, build schemata, and make up experiential deficits in at-risk first-grade students.

NATURE OF THE PROBLEM

There is an ever-widening gap between first-grade students who have strong literacy backgrounds and disadvantaged students who lack such preparation for school. A growing body of research indicates that lack of school success for at-risk students has serious implications for all of society.

One area of concern is the scanty background experience or prior knowledge that many children bring with them to school. Many studies have been done on the gaps in reading comprehension between those with extensive experience and those without. This review will examine this issue of prior knowledge and its link to reading comprehension.

The review of literature has two sections. The first focuses on defining comprehension from the viewpoint of cognitive psychology, and its application for reading and instruction. Second, the problems of at-risk students with regard to reading comprehension will be reviewed.

Cognitive View of Comprehension

Cognitive psychologists view learning as an active mental process of acquiring, remembering, and using knowledge (Mayer, 1992). The background knowledge that an individual brings to a learning situation is vital because what is already known often determines what is learned, remembered or forgotten (Resnick, 1985). According to cognitive scholars, learners actively build understanding, make sense of information, and organize their perceptions into coherent wholes (Bartlett, 1932; Bruner, 1960; Dewey, 1938; Piaget, 1974; Vygotsky, 1962).

The role of the educator is to provide conditions that more fully promote student learning (Dewey, 1934). Dewey (1902) wrote of starting instruction where the student is and leading outward from there, taking into account the needs of the learner when developing curriculum. He advocated sound educational experience involving continuity and interaction between the learner and what is learned (Dewey, 1938). He viewed education as the scientific method by which

individuals study the world around them, accumulate knowledge of meanings and values, and use data collected for critical study and intelligent living. He hypothesized that experience is a moving force that should arouse curiosity, strengthen initiative, and set up desires and purposes. Experiences come from sources outside an individual and do not occur in a vacuum. There is a vast difference between the experience of a child in a cultured home compared to that of a child in a slum tenement. Educators should capitalize on the physical and social surroundings that exist so as to extract from them all they have to contribute to building up experiences that are worthwhile.

In a seminal study that demonstrated the role that background experience plays in understanding, Bartlett (1932) conducted research on remembering stories. He read a complex Native-American tale to Cambridge University students in England and, after different lengths of time, asked them to recall the story. The British students' stories were shorter and more like English experiences. For example, they altered meanings to fit existing story structure, fabricated parts of the story that had not occurred, and omitted other parts that did not fit their perceptions. Bartlett described the readers' rationalizations and attempts at some type of organization to link apparently disconnected events.

Bartlett also noted the role of affect in memory. If the reader's mood paralleled an event in the story, the reader seemed to make stronger connections between the text and his prior experience. Increased comprehension was the result. He found powerful indications that sensory image and the use of language are both important in remembering.

From these early pioneers in cognitive psychology came several different theories on how we store and access information: (a) schema theory, (b) information-processing, and (c) dual

coding theory. These theories will now be individually examined.

Schema Theory

Bartlett (1932) was the first psychologist to use the term *schema*; he attributed it to the work of Head in 1926. However, in 1787, Kant described something similar (Rumelhart, 1981). Bartlett (1932) found the term schema too sketchy and thought *active developing patterns* or *organized patterns* might be more appropriate. He said that schemata are affected by every bit of incoming sensory experience and are living and constantly developing. They are active organizations of past experiences or reactions that render a specific adaptation possible when incoming information is received. Gagne, Yekovich and Yekovich (1993) defined schema as abstract data structures that organize vast amounts of information—a pattern or guide for understanding an event or a concept.

Rumelhart (1981) called schemata the building blocks of cognition, the fundamental elements upon which all information processing depends. They are employed in interpreting sensory data, retrieving information stored in the memory, formulating actions, and outlining goals. Their central function seems to be in the construction of an interpretation of an event, object, or situation, in other words in the process of comprehension (Pearson & Spiro, 1981). Schemata represents all levels of experiences, at all levels of abstraction. Learning, according to cognitive theorists, is basically a schema-development process.

Recent cognitive researchers (Anderson, Spiro, & Anderson, 1978; Rumelhart, 1981) discussed prior knowledge as being organized into schemata. Schemata determine what prior knowledge elaborations are made and can help students select important information.

A Schema Theory Interpretation of Comprehension

The schemata that readers bring to text reflects individual belief systems, nationality, and occupation (Apple & Weis, 1983). When new information enters the brain, there is a search to find existing schemata with which to link or accomodate prior knowledge (Gardner, 1982). If no schemata exist, the information cannot be retained as easily. Teachers may interpret a lack of prior experience to mean a lack of ability or lack of intelligence. However, it most often means that schema for that particular concept is missing. Comprehension clicks only when the reader develops a schema that makes the whole message clear (Anderson, 1994).

Anderson and Pichert (1978) wrote that reading is an interactive activity, involving simultaneous graphophonemic, morphemic, semantic, syntactic, pragmatic, and interpretive processes. They proposed six functions of schemata. They may provide: (a) scaffolding for assimilating text information, (b) selective attention, (c) inferential elaboration, (d) orderly search of memory, (e) editing and summarizing, and (f) inferential reconstruction.

Evidence for Schema Theory

Researchers now know that schemata incorporating world knowledge play an important role in language comprehension. In a cross-cultural experiment completed by Steffensen, Joag-Dev, and Anderson (1979), Americans and natives of India read passages about two weddings: an Indian wedding and an American wedding. They found that readers from distinctly different cultures gave different interpretations of culturally sensitive materials.

Readers from different subcultures within the United States may also comprehend text differently according to their backgrounds. If stories and texts presuppose a certain cultural perspective that children do not share, reading comprehension could be impaired. Minority

children often fail to comprehend school reading materials because their schemata do not match those of the other cultures. Some children may appear to have poor memory and reading comprehension skills. However, this may be because they lack, or fail to activate, the background knowledge presupposed by the text. The question of what it means for a child to be familiar with concepts in a story is more complicated than previously thought (Bransford, 1994).

Implications of Schema Theory for Classroom Instruction

Educators should focus on the building or activation of schemata when planning for classroom activities. Children do not spontaneously integrate what they are reading with what they already know; therefore, teachers need to help children activate relevant knowledge before reading (Paris & Lindauer, 1976). If there is no relevant background knowledge, teachers need to provide it. Hayes and Tierney (1980) found direct evidence to support knowledge-building activities.

Certain classroom strategies may lead to activation of prior knowledge. Prediction techniques such as the Directed Reading-Thinking Activity (Stauffer, 1969) cause readers to search their store of knowledge for what they already know. Ausubel (1968) advocated providing readers with advanced organizers or overviews to bridge the gap between what is known and what the reader needs to know to successfully complete learning. Brainstorming or creating a visual chart or map would also help students to organize information.

Information-Processing

Another cognitive paradigm is information-processing. It also theorizes about the storage and retrieval of information, but it differs substantially from the schema theory. It is a model of memory that also includes the newer neural-network models (Martindale, 1991). Types of

knowledge are categorized as general or domain-specific. They may also be categorized as declarative, *knowing that* something is the case; procedural, *knowing how*; or conditional, *knowing when and why* (Woolfolk, 1980).

The three stages of the information-processing model are sensory register, short-term memory, and long-term memory. Information is encoded in the sensory register where perception determines what will be held in short-term memory for further use. Thoroughly processed information becomes part of long-term memory and can be activated at any time to be retrieved to working memory.

Dual Coding Theory

In contrast to schema theory, *dual coding theory* includes both mental imagery and language as central components of memory. This theory addresses a wider view of comprehension. Dual coding theorists (Sadoski & Paivio, 1994) suggested that our experiences are processed into two separate mental systems, one for processing language (verbal system) and one for processing information of nonlinguistic events and objects (nonverbal system). The latter is often called the imagery system because it includes the analysis of mental images derived from sensory experiences. Mental imagery appears to be consistent, spontaneous, and natural for all readers. It is highly related to appreciation, integration, and comprehension of texts.

Applied Research on Reading and Literacy

Reading Achievement and Income

In a landmark study of reading comprehension, Thorndike (1973) studied 100,000 students from 15 different countries. He found that students in more affluent countries had higher overall reading achievement. Reading achievement was also higher for students from more affluent families than those of more modest incomes. In addition, scores correlated with the professional and educational status of the children's parents. This same gap was reported by the National Assessment of Educational Progress (NAEP) 1986 reading scores (Appleby, Langer, and Mullis, 1988). The NAEP data reported that 17-year-old disadvantaged students scored at the same level as advantaged students at age 13. These data confirm what many teachers have felt—children from advantaged families score much higher in reading achievement than less advantaged children. These gaps become greater with age.

Comprehension and Its Relationship to Prior Knowledge

Johnston (1981) wrote that reading comprehension is the process of using one's own prior knowledge and the writer's cues to comprehend the author's intended meaning. Irwin (1991) changed the word *knowledge* to *experience* to emphasize that both cognitive prior knowledge and interests and attitudes influence what is being understood. At-risk students may not have the necessary prior knowledge, interests, or attitudes for successful comprehension.
Prior knowledge is the key to solid comprehension.

While reading, students access existing schemata to transfer information to new situations, analyze the reasoning used by the author, integrate ideas into a creative product or idea, and make judgments about what is being read. Bloom (1956) called these higher-level

thinking responses—*application, analysis, synthesis,* and *evaluation.* The learner must provide active contributions to the learning context for comprehension to occur (Bransford & Johnson, 1972). Students actively interacting with the content they are reading will make prior-knowledge elaborations. Teachers can use prereading activities to help encourage this. In remedial situations, explicit instruction may include explaining that good readers relate text to past experiences and that this will help them understand, remember, and enjoy what they read.

Strategies for acquiring or activating prior knowledge.

Pearson and Johnson (1978) argued that during instruction for concept development there is no substitute for real experience. However, aids such as pictures, role-playing, or concrete examples are more useful than abstract definitions.

Strategies to fill in the gaps in background knowledge can be such things as movies, guest speakers, field trips, reading other passages about the same topic, discussions, prereading activities, or using library books and magazines. These will all build prior knowledge. Teachers should directly tell students to think back or remember what they already know. Previewing the assignment or writing key ideas on the board are also powerful tools to use. All these strategies will make prior knowledge available for students.

Several well-known strategies include K-W-L, Personal Meaning Guide, and PreP. In K-W-L, students brainstorm in three columns: K-What I know; W-What I want to know; and L-What I learned (Ogle, 1986). K-W-L locks in learning. Macklin (1978) suggested writing a prereading guide with several statements with which students could agree or disagree, followed by reading the selection and discussing how their opinions have changed. In the PreP (Prereading Plan), Langer (1981) suggested that teachers should guide their students to think about their prior

knowledge by choosing words, pictures, or concepts from the text to stimulate initial associations, have students reflect on these associations, and then ask for reformation of prior knowledge using new ideas.

Vocabulary

There is a major link between knowledge of vocabulary and reading comprehension. After reviewing extensive research, Anderson and Freebody (1985) stated that a prerequisite for reading comprehension is word knowledge and that poor readers are probably people who know the meaning of few words.

Chall, Jacobs, and Baldwin (1990) studied 30 young children who were classified low-income based on their eligibility for free or reduced-price school lunch meals. Above and below average readers were targeted and tracked for several years. These children did not lack the ability to comprehend what they read, as assessed in reading comprehension tests in the early grades. This was true until the fourth-grade, when they seemed to fall behind because of slow acquisition of an academic vocabulary and weakness in recognizing unfamiliar words. They noted the changing focus of reading in the fourth grade from reading familiar texts to more abstract and complex texts with more technical words. Understanding at this level required more sophisticated levels of vocabulary, background knowledge, and cognition.

Disadvantaged and Advantaged Students

Bowman (1994) defined at-risk children as those who come to school with personal or family characteristics tied to school difficulties. Bowman concluded that failure starts early and often by the third-grade educational trajectories are fixed.

At-risk children are laden with multiple burdens of poverty such as homelessness, family

stress, and daily destitution (Allington, 1990). Recently, the number of students who could be considered educationally disadvantaged has increased as has the rate of disadvantage (Frymier & Gansneder, 1989). Slavin (1989) defined at-risk students as those unlikely to graduate from high school. Willis (1986) found that poor school performance is a major and early predictor of becoming a school drop-out. Levin (1989) stated that at-risk students are those without the home and community resources to benefit from conventional schooling practices. Pallas (1989) defined educationally disadvantaged students as those who have been exposed to inappropriate education in the family, school, or community. Comer (1987) termed them high-risk children who underachieve in school and consequently will underachieve as adults.

The *Matthew effect* is a term suggesting that disadvantaged students who are slower will likely show progressive retardation as they continue on in school (Stanovich, 1986). Often programs that are good for all students may most benefit advantaged children thus making the disadvantaged fall even further behind.

Children who do well in school are usually advantaged children whose class culture permits or encourages upward mobility. The more nearly upper-class the child's culture, the more susceptible she is to being set in motion by the school. At the other end of the continuum, the lower-class child's culture does not even recognize, much less value, the possibility of rising out of poverty. Upward mobility requires some sacrifice of present for future gratification, without which rising is impossible (Berube, 1984).

Cultural Differences

Cultural differences in prior knowledge, vocabulary, and interest in school-related tasks all influence the comprehension of individual students. Teachers need to teach that diverse

cultural patterns have value, while at the same time teaching the students new ways of comprehending that will help them become successful students.

Heath (1983) reported rich ethnographic data on the language and literacy of culturally different homes. She focused on language habits as part of the shared learning of a culture, defining culture as a learned behavior. Heath's work placed great emphasis on comparing and contrasting the cultures of local communities.

The curriculum Heath recommended included many activities associated with high-quality literacy instruction, play with language and vocabulary development, direct instruction in reading in the content areas, a wide range of reading materials, formal and informal writing and focused on helping children learn unfamiliar information. The notion that all can be successful assumes that all children can learn and achieve school success (Bowman, 1994).

Strategies for Success

Low achievement of educationally disadvantaged children is partly due to teachers who adapt the curriculum downward because of low expectations, who have negative attitudes toward these children, and who use ineffective methods to teach them. The cure would be better teaching, higher expectations, a more stimulating curriculum, and a better attitude toward disadvantaged children (Singer & Balow, 1981). Teachers need to believe that success is possible and interpret growth, even if small, as achievement. (Hauser & Thompson, 1995).

Kagan (1990) defined culture as distinctive patterns of behavior, thought, and perception that are characteristics of a particular subgroup of students. Good teaching must consider cultural differences (Garcia, 1982). The reader's prior knowledge, experience, perspective, and attitude

determine ways in which information is perceived, understood, valued, and stored (Pearson, 1984).

Interaction is the key to learning for at-risk students; language is the key to interaction. Teachers need to become aware of the specific communication skills the children are developing in their homes and adapt them for classroom use. As they do this, the teachers will also show respect for the child's native language (Heath, 1983).

However disadvantaged, most students come to school eager and bright-eyed, ready to learn. By third grade, much of the fire in their eyes has died out. Goodlad (1984) found the classroom tone to be "neither harsh and punitive nor warm and joyful; it might be described as flat" (p. 108). The world of school should never be one of disjointed ideas and facts with little room for imagination, curiosity, and creativity.

Pai (1990) found that many students come from backgrounds that provide them with certain preferred modal learning preferences. Some with working-class backgrounds come with cultural experiences that do not value school learning, but place more value on learning of a practical nature. Many children of color work better in cooperative groups. Smart teachers would make use of a multimodal learning approach with participatory learning experiences to run a well-designed and effective at-risk classroom environment.

A common belief of schools is that urban and poverty students need rigid structure and control accompanied by repetitive drill and practice. This belief almost guarantees that most, if not all, culturally diverse urban and poverty children will not be able to achieve intellectually in school. This has become the expected outcome of U.S. schooling—low or nonachievement for at-risk children. Given the growing numbers of the diverse student population and the predictions of

many more to come, it is imperative that we explore other ways to teach this untapped resource, our at-risk students. It is time we stopped looking at them as our biggest problem and started looking at them as one of our most valuable assets (Waxman, 1992).

Mandates for Change

Edelman (1992) called for "a national crusade of conscience and action that will ensure that no child is left behind" (p. 20). She concluded that we cannot afford to fail our at-risk children as they often later turn into society's most dangerous problems. H. G. Wells (1921) stated that human history becomes more and more a race between education and catastrophe. We already know what we need to do, thus we ignore the need of the disadvantaged at our own peril (Natriello, McDill, & Pallas, 1990).

In spite of calls for reform, schools have not changed much since the industrial age of the 1800's when school leaders sought to pattern their organization after the efficient textile mills of New England. Mass education would mean order and discipline, good management, graded systems, and productivity. Large numbers of children would be sent through the system, the *factory*. The children would move upward through the grades in a logical and orderly fashion while the schools would teach those things that would make all cultures into one. The emphasis was on bells, punctuality, timed completion of tasks, and a hierarchical power structure—all components of the modern factory. The *paycheck* became the grade given by the *boss*, the teacher, for satisfactory completion of a task (Selakovich, 1978). This type of schooling is still very much in evidence today.

A Northern Utah inner-city school superintendent stated that children of the poor come to school eighteen months delayed from those of wealthier families. His school district has an

ethnically diverse population with several languages and cultures represented. School may not be particularly valued in many of these diverse homes. Books and other materials necessary for emergent literacy may be scarce. Indeed, in many of these homes, literacy activities involving verbal interaction with adults may rarely occur.

Contrast this to the fact that some children enter kindergarten having had as many as 1000 hours of informal literacy activities in their own homes (Miller, 1995). The differences between a child of print-rich environment compared to a child of a print-deprived environment are very stark in the early grades. There is a large literacy gap to be filled in the background knowledge of many of the primary grade students.

Specific Strategies

Teacher classification of enrichment activities useful for building background knowledge included field trips, library visits, trade books, type of materials, creative writing, book reports, reading and writing homework, and writing frequently (Chall, Jacobs, & Baldwin, 1990). Analyzing prior knowledge was found to be a better predictor of reading comprehension than a standardized reading achievement test or an IQ test (Langer & Nicholich, 1981).

D'Alessandro (1990) found that meaningful insights are gained when the experiences gained from reading are attached to personal experiences and writing is taught parallel to reading. Ladestro (1991) stated that each child is already a whole language learner and claimed that whole language works for at-risk children, no matter the race, ethnic background, or what language is spoken at home. It is total immersion in words and books and allows multisensory language learning experiences that are varied, meaningful, and fun.

Au (1981) stated that reading lessons should have three parts: ETR—Experience, text,

and relationships: (a) The teacher evokes comments from the children about their experiences in relation to the story; (b) they read several pages of text silently; and (c) the teacher draws out relationships between the text and their experiences. Au found that the ETR process increased the reading scores of 1st graders in the Kamehameha Early Education Program (KEEP) from the 19th percentile to the 69th percentile in three years. She believed that the rapid interaction of teacher to students and students to each other provide cooperative interaction that builds cultural and content congruence and thus is more engaging than most types of reading lessons.

Vocabulary development is an important part of successful programs that help at-risk children learn to read. To foster this vocabulary development, good programs: (a) stress vocabulary, not only in reading, but also in content areas, using trade books, magazines, comics, maps, and encyclopedias; (b) do not spend time looking up words in dictionaries; (c) have reading materials at all levels so all are challenged; and (d) expose students to new vocabulary in context by using field trips and other activities. These experiences build background knowledge necessary to understand new words and any other reading done on the subject in the future (Chall & Snow, 1988).

Stauffer (1970) defined the Language Experience Approach (LEA), on work initiated by Allen. He stated that it is very useful for children who have language deficiencies or have English as their second language. LEA includes three procedures: (a) dictated experience stories, (b) word banks, and (c) creative writing. The dictated experience stories are the core of the program and are used as a way to get started with reading. The teacher begins with whole-class dictated stories and moves into group and individually-generated stories. To generate the dictated story, the teacher locates a stimulus for the class that broadens their horizons and causes the children to

examine their world more carefully. The stimulus might be an idea, an object, an event, or an experience. The students use their senses to perceive the experience and then prepare to discuss it with the class.

The teacher gathers the students to dictate a story. She asks the students to tell about the stimulus and the ideas are recorded by the teacher. The sentences are reread to check for proper recording of ideas. The students may draw a picture about their story or identify known words. On successive days, the story is reread by the class and is reproduced for each student. The students underline known words and after a short length of time, they try reading it individually. They keep their stories in a file for further rereading. The Language Experience Approach provides rich vocabulary growth along with deeper and broader schemata production. The children feel a sense of ownership in stories of their own experiences and benefit from the interaction and processing of new ideas with their teacher.

Conclusion

Research has clearly demonstrated the need for innovative ways to reach at-risk students. Their lack of prior knowledge and learning style differences are not being accommodated in today's schools; thus many are failing to succeed. The at-risk children in our schools today did not choose their circumstances. They do not wish to fail; they deserve every chance for success.

Using multisensory field experiences to build prior knowledge, combined with thematic pre and post activities to focus learning, mixed with verbal interaction with the teacher to process new ideas, will serve to build vocabulary in context and increase background knowledge. Schemata will be strengthened in this cooperative literacy process.

PURPOSE AND OBJECTIVES

As the literature has shown, comprehension requires that students have the necessary prior knowledge or schemata (Irwin, 1991). A framework for knowledge must be constructed in the mind in order to process all incoming sensory information. This complicated procedure is not completely understood, but if schemata do not exist, learning cannot take place.

American schools have neglected the growing problem of at-risk students. The curriculum has not addressed the learning styles of the disadvantaged. Most of them learn better by doing, by collaborating with a peer group, or by interacting with an adult to help them build meaning from experiences. It is not that they cannot learn, but that they have not been given ample opportunities to learn their way.

The main cause of social disadvantage in early childhood is experiential deficits (Passow & Elliott, 1967; Deutsch, 1960). If background knowledge is sparse or nonexistent, as is the case in so many disadvantaged students, the scaffolding of schemata may be too fragile to support the learning.

Little research has been done on the direct effects of field experiences on comprehension, even though there is a large body of research to support the use of experiences to build background knowledge. As far as this author knows, no one has yet studied the effects of using field experiences for first-grade disadvantaged students in terms of building prior knowledge.

The purpose of this project was to determine what types of things could be done to build prior knowledge of at-risk first-grade students. Specifically, could background experience levels of disadvantaged first grade students be increased through the use of field experiences, coupled with pre-experience activities, using trade books and a thematic approach, and a post-activity

debriefing using the Language Experience Approach?

For the purposes of this study, *background experience* and *prior knowledge* were defined as personal knowledge based upon experiences. Students were defined *at-risk* based on personal or family circumstances. *Field experiences* were defined as trips that take the children out of the school into the real world for authentic experiences to build prior knowledge.

METHOD

Using qualitative research methods, the researcher investigated prior knowledge growth of four at-risk first-grade students based on field experiences. Acting as a participant observer, (Spradley, 1980), the author engaged in the field experience activities while at the same time seeking to observe all aspects of the situation. Observational data were collected on different field experiences using an observation protocol described by Bogdan and Biklen (1992). The researcher also conducted structured pre-trip and post-trip interviews of four at-risk students using open-ended questions. Student journals were collected and analyzed for richer and deeper vocabulary and concept growth.

Participants

First-grade students from an inner-city school in Northern Utah were studied. All the members of the author's class participated in the field experiences and observations. Four at-risk students from the group were selected for the pre-trip and post-trip interviews. They were chosen on the basis of personal or family at-risk characteristics. All the participants remained anonymous as pseudonyms were used throughout the study. The demographics of the class were included in the final project report. The researcher gathered observational notes as a participant in the field trips. Because the researcher was also the teacher, her data, reflections, and descriptions may have been colored by her biases.

Procedure

Three field experiences were scheduled for the fall of 1997: (a) a trip to a large garden, (b) a trip to the North Fork Environmental Center, and (c) a trip to the Hill Air Force Base Museum. Student interviews, observational data, and journals were all used to collect data.

Interviews

A pre-trip interview was conducted with each of the four identified at-risk children during the week prior to each activity. A structured interview format was used to guarantee that each student received the same questions and prompts. Open-ended questions were asked to determine levels of prior knowledge of the student participants.

The interviews were recorded and served to corroborate the content of notes that were taken. The audiotapes were used for verification and review of the conversations held.

A post-experience interview was held with each of the four at-risk students following the field trip and accompanying activities. The interview served as a debriefing tool as it probed for deeper and richer understanding of the subject than was shown in the pre-trip interview. Repeated interviews with each participant helped to establish the trustworthiness of the data used.

Observations

Direct observations were done by the researcher on each field trip using an anecdotal record with a column for interpretation. The design of the observational protocol was a single page with a line drawn down the middle to separate the descriptive notes from the reflective notes. This research form was included as Appendix A of the report.

Journals

Each field trip had a different graphic organizer for the students to take notes on, draw on, or write on as they experienced the garden, the mountains, and the airplanes at the museum. It served as a record of the multisensory experience of the students. Journal pages were also included in the appendices.

Instrumentation

Structured interview questions were designed for each trip using open-ended questions. The same questions were asked again for the post-trip interview. The oral interviews were audiotaped.

An observational protocol was designed for an anecdotal record on one side and interpretations on the other. A journal form was also designed for each trip so that students could record their experiences as they happened.

Data Analysis

The qualitative data were analyzed as suggested by Bogdan and Biklen (1992), then read through to identify common patterns and themes. Afterwards, the emerging themes were color-coded to categorize the information in the data in order to synthesize it (Cresswell, 1994). The findings and the results were written and conclusions were drawn.

FINDINGS

The purpose of this project was to determine what kind of things could be done to build the prior knowledge and reading comprehension of at-risk first-grade students. Three field experiences were used to investigate the prior knowledge of four disadvantaged first-grade students from the author's class. An observational record was kept during each field experience and student journals were completed afterwards. After the pre-interview, the children were prepared for each field experience by using a thematic approach to give them some background knowledge. A post-activity Language Experience Activity was held where the class dictated a narrative about their experience and then reread it frequently. Following all the activities, the post-interviews were conducted.

The data were analyzed and interpreted after they were collected. Data analysis was conducted simultaneously with the writing of the qualitative narrative as suggested by Cresswell (1995). Reoccurring themes and patterns were color-coded. Categories were then identified before the actual writing of the qualitative text took place. The separate categories concerning scant prior knowledge seemed to fall mostly within the pre-interview range. After the field experiences, however, growth in richness and depth was evident. There was less scarcity, although some did appear. Due to the differences in the depth and richness of the data before and after the field experiences, they were analyzed for each field experience in two distinct sections: pre-activity and post-activity.

Because all the observations, interviews, and interpretations were conducted by the author, they may be biased. Perhaps another researcher would not be able to replicate the findings with her own study. On the other hand, using the same methods to build prior knowledge,

perhaps she would uncover similar patterns if she were studying an at-risk population. It would be doubtful that an advantaged student population would show the same prior knowledge growth.

The schedule of field experiences follows: An excursion to a large garden was held on September 15, 1997; a bus trip to the North Fork Environmental Center was held on October 1, 1997; and a field experience to the Hill Air Force Base Museum was held on October 29, 1997. Related activities were held several days prior to and following the experiences.

The demographic descriptions of the four participants who were interviewed is included in the following section. Each field experience will then be described using the researcher observation record, student journals, and LEA activity. The pre-trip and post-trip interviews are included in the Appendices.

Participants

The four at-risk children chosen for this study were selected on the basis of personal or family characteristics that leave them at-risk for failure in the public school system. The school they attend has a population of lower socio-economic families with a high rate of single-parent homes and free or reduced lunch programs. Pseudonyms were used for each of the four children throughout the study. The following is a description of each child that was interviewed.

Adam

Adam is an enthusiastic young man. His father died of a brain tumor when he was a baby. He now has a step-father whom he idolizes. He is hoping to be adopted by him soon. His mother said that when he was a baby he had seizures approximately every 40 seconds. At one point, she rushed him to the hospital fearing that he was dead because he was so unresponsive.

In the first grade Adam often stops working to stare out into space. His mother has

scheduled a brain scan evaluation for him in the spring to analyze his current seizure status. She also has been coming each night after school to see if he has finished his assignments. Because of the constant interruption in his school work, it has been hard for him to complete anything. At his mother's insistence, however, he is getting more focused, is less easily distracted, and is completing tasks much faster than previously. Perhaps it has not been so much a matter of mini-seizure activity as just poor work habits. It has helped him a lot to have his mother so interested in his school assignments. She has also taken time at home to help him with his reading, which has greatly improved recently.

Josh

Josh is the child of a Caucasian mother and an African-American father, whom he does not know. His mother is a drug addict, so he is under the guardianship of his maternal grandmother. She tries her best to raise him, but she has a heart condition and other health problems. There are several uncles and aunts and some smaller children involved in the family. When he refers to his father he is really talking about his Uncle Max. Josh recently told his grandmother that when he grows up he wants to be white like she is. He seems to be struggling with his racially diverse background.

Josh is on seizure medication which seems to control his seizures most of the time. He was very heavily medicated in kindergarten. Upon talking with his first-grade teacher, the doctor prescribed a smaller dose of seizure medication that has allowed him to remain more alert. Twice he has gone to sleep on the floor. Because this is an indication of a seizure, he has been removed from the room for observation. He tends to be very incoherent when he awakens and wanders off if not closely monitored. Josh has also been diagnosed with Attention-Deficit Hyperactivity

Disorder, (ADHD), for which he is medicated. Several times this year his doctors have had to adjust his ADHD medication. When his medication is working, Josh is able to concentrate. He is a fine reader and is one of the fastest workers in the class. When properly medicated, he is able to be around the other children and be a responsible citizen. When he is off his medication, or when it is not regulated properly, he is constantly hurting other children and then denying his behavior.

Josh's eyes move nervously in constant side-to-side motions. He tends to talk very rapidly, often to himself. His grandmother is trying to get him an appointment with Primary Children's Medical Center for a psychiatric evaluation because she says he has a lot of emotional problems. His interviews indicate a rich fantasy life.

Samantha

Samantha lives in a very precarious family situation. Her mother has a long history of substance abuse and criminal activity. The mother is currently under house arrest with electronic surveillance. She shows little or no interest in her children or responsibility for their actions. Samantha has an eight-year old sister and an eleven-year-old cousin who also attend the school. The eleven-year-old tries to fill the role of the caretaker for the younger ones.

The children are habitually tardy or absent. Several months ago, the two smaller children were caught smoking on the school grounds during morning recess. They fled the school premises upon being confronted and were suspended for their activities. They have continued to smoke, however, and the principal was recently informed that their parents did not attend the mandatory substance abuse class with them.

The primary responsibility for raising these children seems to fall to an alcoholic grandfather and a grandmother who is often in the hospital suffering from emphysema. It was the

grandmother, complete with her oxygen tank, who attended Samantha's last parent-teacher conference. The teachers have never met the parents.

When Samantha does come to school, she is often filthy. She has lost several coats that have been given to her by the school secretary. She sometimes comes in cold weather without a coat. She usually comes to school without breakfast. When she arrives too late to eat school breakfast, she complains throughout the morning about how hungry she is. When the teacher called the grandfather to discuss this problem, he hung up on her. The school personnel have called Social Services a number of times in regard to the neglect of these children.

Although she has a lot of potential, Samantha is often disruptive in school. She does not comply easily with classroom rules and often challenges authority. She has a lot of nervous energy and has trouble focusing on tasks at hand. She has a limited vocabulary and poor use of the English language as will be pointed out in the interview section. Academics do not seem very important to her. Survival, however, is uppermost in her mind. She is very "street-smart." She often takes things that are not hers and has trouble telling the truth. She hurts the children around her and then denies any wrong-doing on her part.

Peggy

Peggy can be a cheerful child. She is a fairly good reader. She brings books from home to share, however her parents do not seem to listen to her read. She has had a chaotic home life, including a father who has no legal rights to see her. Her mother was employed last year as a playground monitor at the school, but is currently working elsewhere. This may tend to increase Peggy's anxiety, as her mother was close at hand last year in case of trouble. Her mother has had several husbands and boyfriends and is currently married to Peggy's stepfather. He is very loud in

vocally proclaiming what they can do in the home to make sure that Peggy complies with school requirements. Recently he has come to the school angry and shouting about one complaint or another. He seems to be in desperate need of an anger management class before someone gets hurt. Peggy has said that when he gets angry at home he throws things such as dishes at her mother.

Peggy recently had her tonsils out, which will hopefully make her feel better. She has been constantly sick this year and this has interfered with her school work. Her mother has blamed her academic problems on her tonsils; but since they have been removed, the problems only seem to be getting worse. Her mother tends to blame other factors instead of looking for solutions close to home. Her parents often make promises to Peggy that they do not keep and this seems to be making her very wary and mistrustful of adults. She looks sad and unhappy much of the time.

Her primary problem in school seems to be the lack of fine muscle control. She has a severe problem writing or copying from the board and this slows her down considerably. She also finds many other things to do when it is time to work instead of getting right down to the task. When she notices that the other children are finishing something that she has barely begun, she begins to "shut down." She refuses to work and often sulks, thus putting her further behind. She responds very favorably to having individual help from the teacher or having another child to do her work for her, but "learned helplessness" is not the solution. Perhaps if she would learn to organize her materials, get immediately to work, and complete the tasks that all the other children are expected to do she would feel more successful at school. She gets belligerent when she has to miss recess to finish her work, but that is the class expectation for everyone. She recently cut big

chunks out of her sweatshirt when she was doing an activity because she could see that she was falling behind. The teacher has condensed her work somewhat and this has seemed to make her a little less discouraged and more able to complete the shortened versions. She has also been put on a contract where she gets a little sticker for each completed assignment. When she gets ten stickers she gets a treat. This has seemed to be temporarily motivating to her.

Garden Field Experience

Researcher Observations

The field experience was held as scheduled on September 15, 1997, in spite of thunder, lightning, and a ten-minute downpour of rain immediately before the trip was to begin. The teachers were all upset because Mrs. Smith's class had five drivers who did not show up so her class could not even come to the garden. There had to be a quick change in plans. It was decided that the mini-class rotations would be held back at school after the trip. This meant that both remaining classes had to be in the garden at the same time. This was unfortunate, because the children could not get close enough to things to see what was being discussed. It was also hard for them to hear everything that was being said. It was not an ideal situation. There were simply too many children to handle in each group. Normally there would have been two groups up on the grass under the large nut tree, one holding class about pickles, and the other holding class about tomato products, and then they would have rotated through all the three experiences.

When the two classes arrived at the garden, they found the ground to be very muddy and the skies still threatening rain. However, by the end of the excursion the sun had come out and all was well. The children were well-behaved considering how large the group was.

The children seemed surprised that they could not see the potatoes up above the ground. They were thrilled after the potatoes and roots were dug out of the hill with a pitchfork. They said that the potatoes grow "under the weeds", meaning under the potato plants. They do look pretty bedraggled and weedy by that late in the season.

All of the children seemed to recognize tomatoes and onions. Upon coming to the green beans, they unanimously called them *peas*. They also called the cabbage *salad*. This seems to be

universal to first-graders. They knew about sweet bell peppers, except the new red and yellow varieties. They also knew about hot peppers like Jalepeno and Anaheims.

They wanted to know all about the melon patch and wondered where the watermelons were. It was explained that this had been a poor year for watermelons and they were shown a tiny undeveloped watermelon. They seemed well-acquainted with zucchini squash, but it was only the sharper students who knew what the broccoli was. They were excited to see corn and squash and gourds. They were especially excited to see the large pumpkin patch because they knew they would be going back in October to pick out a pumpkin.

When the two classes returned to school, they joined with the other class for rotations. Mrs. Smith taught a class about the difference between cucumbers and pickles and gave them a taste of each.

Mrs. Hadley taught a class about tomatoes and products made from tomatoes such as tomato sauce, soup, salsa, and tomato juice. She was trying to expand their thinking from simple tomatoes to other products using tomatoes. She fed them cherry and pear tomatoes.

Mrs. Penner taught a class about seeds using a large dried bean pod to show them the seeds within. They were also shown the blossoms on a tiny pumpkin and on a bean plant. A discussion followed about the reason for flowers—to make seeds. First the fruit grows out of the blossom and, of course, the fruit contains the seeds. They were fed three different kinds of melons that grow in the garden. They were taught that the deeper green or orange the fruit or vegetables are the more vitamins they contain.

See Appendix A for a sample of the split observational protocol with the anecdotal record on the left and the interpretations on the right-hand side. This blank form was used for

researcher observations on each of the three field experiences.

Interview Data Analysis

After analyzing the data from the pre-trip and post-trip interviews it seemed apparent that Josh and Peggy showed the most growth in depth of knowledge. They both went from knowing very little to knowing almost everything that was taught. Adam and Samantha showed a lot of growth, but not as much as Josh and Peggy. Perhaps Josh and Peggy are more observant. The garden pre and post questions are included as Appendix B. The narrative on the pre and post-trip interviews is included as Appendix C.

Student Journals

Upon returning to class, the students filled out a Garden Journal page. See Appendix D for a sample. The students were asked to draw the garden, their favorite foods from the garden, how potatoes grow, some tomato products, and what pickles are made from.

The class journals as a whole showed a lot of detail, especially the potatoes hanging from roots and the tomato products. The four at-risk children who were interviewed also showed a good depth of understanding in their journal pages. It was just one more way to check the growth of their prior knowledge and to triangulate the data.

Language Experience Activity

The children generated a class story on sentence strips for the pocket chart; then they illustrated the strips to help them remember what they were about. This story was reread several times a day for three days. The text was then typed so each child could have a copy. Stauffer (1970) suggests that each child try to read the text to the teacher daily for three days in a row.

On the first day, each word that they can read should be underlined in red, the second day

the words they read are underlined in blue, and the third day they are underlined in green. This process was undertaken, but it soon became apparent that with one teacher and twenty-four first-graders there would never be enough time to read daily with each child. It was early in the first grade when most children are not yet skillful readers and it was a long, slow process.

Thus it was discovered that although LEA is a fine way to lock in learning, reading the text three times with each child was not practical without a classroom aide. In the two remaining field experiences in this study, the LEA experience was confined to only the class-generated pocket chart story. It was also greatly shortened and simplified in order to give success to most of the first-grade readers. The LEA text for the garden field experience can be found in Appendix E.

North Fork Environmental Center Field Experience

Researcher Observations

As the class traveled up the canyon on the bus, the children were so excited! Everything brought new exclamations of surprise—the wind in the mouth of the canyon, the beautiful autumn leaves, the waterfall. When the bus came to the reservoir, the noise rose up in a great crescendo roar, causing one mother to wish that she had brought along a bottle of Tylenol! Many of the children said they had been swimming at the reservoir. This was surprising to the teachers who thought they were showing them new territory.

The director of the center taught the children about the skulls of different animals. He also showed them various hides and antlers. The children fought over the skins as he passed them around. They have a hard time organizing themselves into rows and taking turns. They were very impatient and rude with each other.

Following the skull lecture, the teachers taught three mini-lessons in rotation. Mrs. Smith read a story about camouflage and then had the children find colored toothpicks that were hidden in the grass, Mr. Lemon did a Leaf Person art activity, and Mrs. Penner taught the children about the limiting factors of animal populations by playing "Oh Deer." The game taught that the deer will die if they cannot find enough food, water, or shelter. Many of the children had trouble following verbal directions.

After lunch the children all played the Thicket Game. Most of the children hid in the brush and pretended to be deer while several "cougars" tried to find them. It was truly amazing when the children were told to stand up to see how carefully they had been camouflaged in the bushes. They often were right in front of the "cougars" without being spotted. This game served

to reinforce what they had learned earlier about camouflage from Mrs. Smith.

For the last activity of the day the director took the children on a hike. Many of the children complained about the distance—it was not very far. They complained about the heat—it was warm, not hot. They insisted that they had to go to the bathroom—they had just gone right before the hike. They said they were thirsty—they had just had a drink.

Interview Data Analysis

The growth in depth and richness of prior knowledge was quite remarkable between the pre-trip interviews and the post-trip interviews. In several cases, the children went from no knowledge whatsoever to a great understanding of the subject. This was especially true for Josh and Peggy. As mentioned before, Adam and Samantha seemed to have a more difficult time processing oral language. They never seemed to answer a complete question, but only focused on a portion of it or missed the point altogether. It may be that they are language disabled possibly because of many chronic ear infections during the period between ages two to five when language patterns are being developed. Or perhaps no adult in their early years really took the time to talk with them about the experiences they were having. At any rate, assessing their prior knowledge growth was more difficult, although much growth was evident. The pre-trip and post-trip interview questions are included as Appendix F. The pre/post interview narrative is included as Appendix G.

Student Journals

The day after the North Fork Environmental Center field experience the children were asked to fill out a journal page. They were asked to draw and write about three things that all animals need in order to survive; to draw the habitat of the mountains at the Center; to draw an

animal using camouflage; and to draw three wild animals and three pets.

In general the class did very well and showed a lot of growth in background knowledge. Almost everyone had food, water, and shelter as the three elements needed by animals for survival. Their pictures of the mountain habitat included pictures of pine trees and autumn leaves with lots of detail. The most amazing pictures were of camouflage, which they had learned to understand from the viewpoint of the animals. They did not seem to understand the directions for drawing three pets and three wild animals. Many simply drew the same animal three times. Perhaps the question should have been worded, "Draw three different wild animals and three different pets."

The student journals of the four at-risk students included in this study showed a good depth of understanding. Only Peggy listed all three elements that animals need, but she did not get the last two questions answered. This may have been due to her lack of small muscle control, her trouble in writing rapidly, or her poor work habits. She is a very slow worker. The North Fork Environmental Center Journal page can be found in Appendix H.

Language Experience Activity

The LEA had to be generated the day following the field experience because of the all-day nature of the trip. The text and vocabulary were purposely simplified, but the children had so many things they wanted to write about that it got longer than the teacher intended it to be.

The LEA was supposed to be written in chronological order according to the activities of the trip, but some of the children thought of details later that they wanted to include. The LEA text for the Environmental Center field experience is included in Appendix I.

Hill Air Force Base Museum Field Experience

Researcher Observations

The Hill Air Force Base Museum field experience was scheduled for Friday, October 24th, but had to be rescheduled for Wednesday, October 29th. Although the weather only looked threatening where the school is located, it was snowing hard in Roy on the day the field experience was scheduled. The day of the rescheduled trip was cool and cloudy—just perfect for the field experience.

Upon their arrival at the museum, the first-graders were greeted by several retired Air Force pilots who were to be the tour guides. Grant, a retired B-17 bomber pilot, took the children to a classroom where he taught them many things about the various airplane models that were suspended from the ceiling. He taught them that A = Attack, B = Bomber, C = Cargo, and F = Fighter. They became really adept at recognizing what type of plane they were looking at as they toured the museum and read the signs by each plane.

Grant asked them many questions about airplanes. The class that had studied the thematic unit about airplanes prior to the trip knew a great deal about flight. The only mix-up occurred when he mentioned war. Because it was Ribbon Week some of the children got confused about the difference between the war on drugs and war in general.

When he heard that they were concerned about drugs, he told them that the Air Force would never accept an application for a fighter pilot position from someone who tested positive for drugs in the last three years. He said that they do a test on their hair to determine their drug use history. He told the children that the Air Force spends $1,000,000 to train each jet pilot and they would never waste their money on someone who did drugs. It was an impressive message

for them to hear.

Grant was most knowledgeable as he led the group through the facility both inside and out. Those who stayed close and listened to him learned a great deal. At-risk children often have a hard time paying attention and some of them could not forego this grand opportunity to goof off. Many probably did not learn anything because they would not stay by the guide and listen to his interesting stories. The teachers and parents had to keep reminding the same few children that the reason they came was to listen and learn, not run around.

There was a lot of interest in the ejection seat. Grant sat children in it one by one so they could experience how it would feel. The children were also very interested in the Blackbird, an enormous black spy plane. They loved hearing that when it lands it is white-hot from friction. They tried to figure out how the pilot could get out if the plane was that hot and could not be touched for some time. It was a most interesting and informative morning for those that listened and paid attention.

Interview Data Analysis

Although there were a few areas in the post-interviews where the children lost their focus, engaged in fantasy, or gave information contrary to emerging themes, for the most part the growth in depth and richness was substantial. They all seemed to understand the physical laws of aerodynamics: lift versus gravity and thrust versus drag. They were beginning to understand the complexities and causes of war and shaky international relations. They got a glimpse of what kind of commitment it would take to become a pilot. They seemed to have much broader and deeper background knowledge about airplanes and the history of flight than they had before the field experience. The pre and post interview questions can be found in Appendix J. The narrative

from the pre/post interviews in included in Appendix K.

Student Journals

The journals that were completed by the class showed detailed pictures of their favorite planes, both large and small. They also drew bombs and missiles with great detail. They wrote about why we bomb other people by copying off the board, "For freedom and peace and our flag." Many of the children drew American flags in several places on their papers.

The journals of the four children in this study were also detailed. Adam and Josh drew very detailed and colorful journal pages. Samantha and Peggy did not add as many details nor were theirs as colorful. Peggy's journal looked like the work of a much younger child because of her problems with fine muscle control. The Hill Air Force Base Museum Journal page can be found in Appendix L.

Language Experience Activity

The LEA activity took place the afternoon of the experience. This was ideal because the experience was still fresh in the minds of the children and they remembered everything vividly.

This final LEA text was simplified to the point that it was much easier for them to read repeatedly as a class. It was written in rather general terms with easier vocabulary than the previous two attempts. The children seemed to appreciate being able to read the text more easily. This text is probably the kind that all the field experiences should have generated, simple to read. The LEA text for Hill Air Force Base is included in Appendix M.

CONCLUSIONS

Research has clearly shown a need for more successful teaching strategies that reach at-risk students. The purpose of this project was to build prior knowledge and reading comprehension of first-grade at-risk students through the use of field experiences and related activities.

The documented evidence in the Findings section of this project detailed the developing understanding of the four at-risk students who were studied. Their background knowledge of gardens, environmental issues, and flight became deeper and richer as was pointed out in the interview sections found in the Appendices. This in turn pointed to the successful completion of the goal of this project, the building of prior knowledge.

It could be confidently stated that the use of field experiences is a powerful way to build background knowledge. The field experiences were enhanced by using a thematic approach including trade books on the subjects studied, student journals to record images that the children remembered, and Language Experience Activities, class-generated text, to be read and reread by the class. All three first-grade classes participated in the field experiences, therefore background knowledge was enhanced for approximately seventy children. The most vital part of this project seemed to be the use of the thematic units, student journals, and LEA texts to lock the learning in. The schema growth of the class who participated in all of the activities seemed much stronger than that of the two other classes who participated in the field experiences, but not in the extra processing of those experiences. At any rate, experiential learning proved to be an important link in the education of at-risk students.

Readence, Bean, and Baldwin, (1995) stated:

> As teachers, the fruit of your labors will be *learning*: "transfer of information from short-term to long-term memory." Any experience-based modification of the schemata involves learning. Once again, as many cognitive psychologists have found, episodic memory has been shown to be much more powerful than semantic memory. The use of field experiences and related activities is hereby recommended as an important way to help at-risk children succeed and catch up to their more advantaged peers in terms of prior knowledge and reading comprehension.

The use of field experiences to build prior knowledge in at-risk students is an area that has been largely unexplored in the past. There is a need for further research in this field; it seemed to make such a difference in the understanding of the four at-risk students who were studied. A comparison between those who received field experiences and those who did not might yield interesting data.

Additional studies on this topic could be investigated using a field experience to compare two groups of at-risk children; one group with, and one group without, the additional pre and post activities, student journals, and LEA activities. It would be interesting to investigate whether or not the field experiences alone were enough to build the rich growth in prior knowledge that is evident in this study, or if the added activities used to process the new knowledge were the key to greater understanding and learning.

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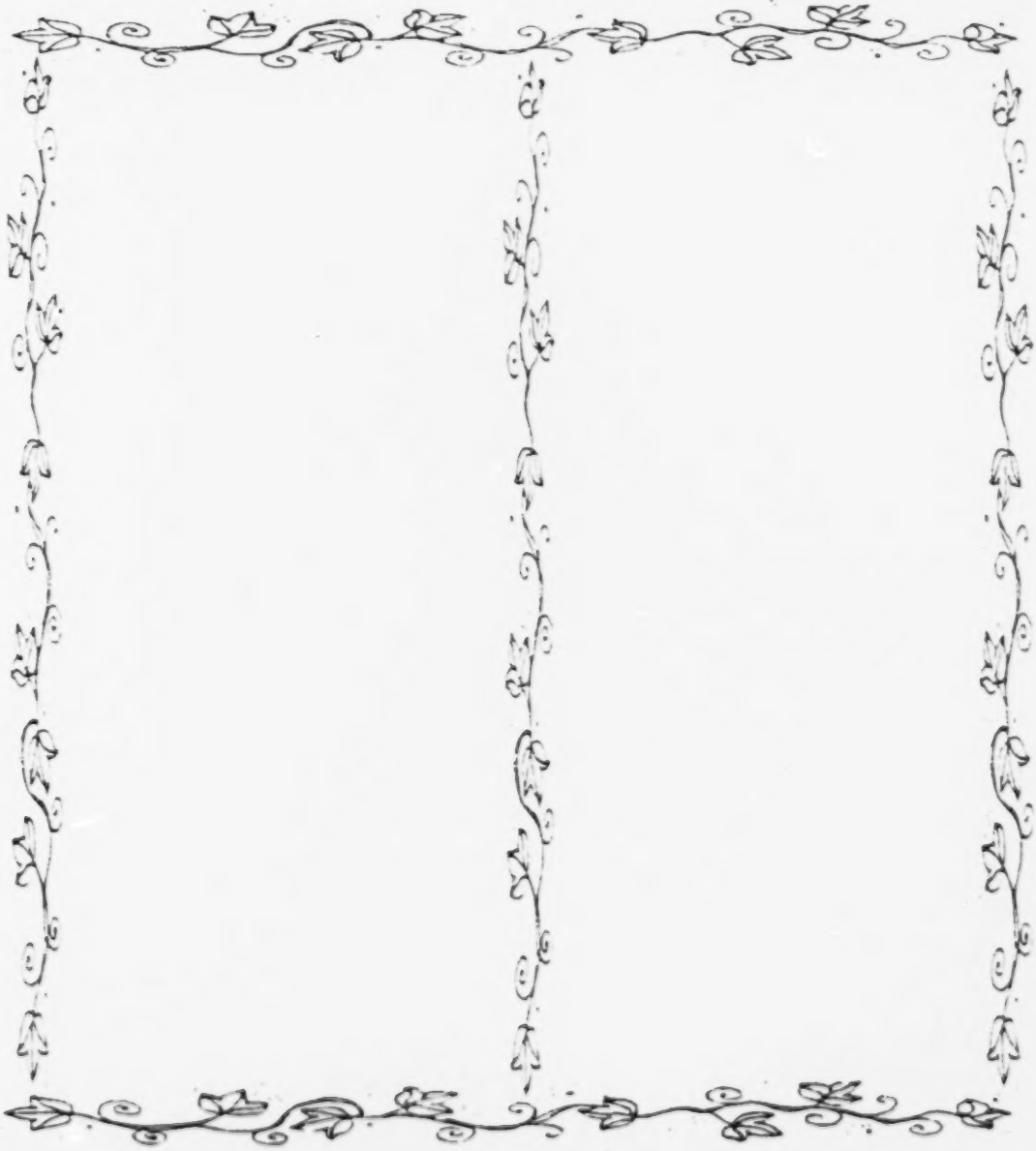
Appendix A
Observational Record

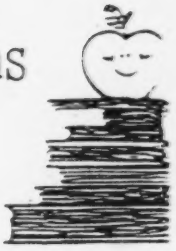
Observational Record
Master's Project

Anecdotal Record | Interpretations

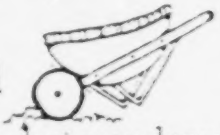


Appendix B
Garden Pre/Post Experience Questions

Pre/Post Experience Questions



Garden



1. Tell me what you learned about gardens.

2. What can you tell me about vegetables?

3. Tell me how you think potatoes grow?

4. What things are made from tomatoes?

5. Do you know where we get pickles, what they are made from?

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Appendix C
Garden Pre/Post Interviews

The major categories of data for this field experience were coded into the following categories: (a) confused or scant vocabulary, (b) loss of focus, (c) sparse schemata, (d) misinformation, (e) fantasy, (f) affective remarks, (g) information contrary to emerging themes, and (h) depth of knowledge. In the following narrative, these separate categories will each be addressed.

Pre-Activity Interview

Confused or Scant Vocabulary

Certain terms were often heard during the garden experience that are typical for most first-graders. They frequently referred to cabbage and lettuce as *salad,* green beans as *peas*, and cucumbers as *pickles*. This is perhaps due to undeveloped schemata common to their age level. First-graders seem to have a good grasp of general categories, but not of specific details.

When asked what vegetables he liked, Adam mentioned the "green stuff that's long." When asked if it was celery he replied that he thought so. When asked what kind of squash he liked he said, "Green—I like that kind." While answering a question about potatoes, he suddenly said, "I know how *gripes* grow—on vines." Josh stated that he liked lots of *napples*, also getting off the subject of potatoes. When quizzed about how she liked to have potatoes fixed, Samantha replied, "Cooked. I hate them without cooked."

Loss of Focus

Josh, when being asked about gardens, suddenly began expounding on how much he liked pumpkins. He seemed confused about the general purpose of the garden field experience and seemed to think it was just to get pumpkins. There was a Pumpkin Patch trip scheduled for a

month later, on October 13th, when he did receive a pumpkin.

When asked about vegetables, Josh seemed to be trying to please the teacher. He was trying to sound like he knew a lot about vegetables and regressed into a discussion about peanut butter.

Sparse Schemata

Adam, upon being asked to tell what he knew about gardens, stated that they were for planting weeds and grass. When asked how potatoes grow he said that they grow out of the ground. When pressed for further details, he stated that they grow in dirt. He knew nothing about products made from tomatoes nor about pickles. He replied, "Nope!" to both questions.

Josh, on the other hand, was very wordy without saying anything of substance. His train of thought was as follows:

> I like to pick up the broccoli and stuff and I used to to like the broccoli, but now I don't. Now I like to pick up potatoes and stuff and lots of stuff that I can. This is a lot of fun stuff that I like to do about gardens. I like vegetables. I like broccoli and salad and stuff and I like *"alots"* of fruit too.

Josh seemed to be using the phrase "and lots of stuff" to fill in empty spaces in his dialogue. He really had nothing of substance to say. It was difficult to tell if he was only trying to please the teacher with his vast store of knowledge or if he was nervous about being tape-recorded. Perhaps he thought he would not be invited to go to the garden if he did not show some interest in what was to be found there. In school he tends to talk endlessly to no one in particular.

Often he will talk to himself. His answer to the question about how potatoes grow was equally evasive. When it came to the questions about tomatoes and pickles he was more honest and admitted that he had no prior knowledge about the vegetables.

Samantha had a general knowledge about gardens and talked about carrots, apples, peas, oranges, and "lots of other stuff" that her Uncle Lenny grows in his garden. This broad answer was befitting the question she was asked, "Tell me what you know about gardens." Vegetable gardens were not specified. The next question, however, was specific to vegetables and her answer was, "Apples and oranges and—I don't know. I forgot. I only know apples and oranges." This is a clear case of sparse schemata. She had no knowledge about tomato products and what pickles are made of.

Peggy's answer to the garden question was also broad. She mentioned bushes that grow flowers and fruit like apples and oranges. The broad garden question could have been about flower gardens or orchards, so her answer was acceptable. When asked about what she knew about vegetables, she had no reply. She also did not know about products made from tomatoes or anything about pickles except that she likes the ones that are sour. Her background knowledge was very scanty.

Misinformation

Adam, when asked about his favorite vegetables replied, "Pork chops—I like those. Pork chops are good!" He seemed to have his food groups mixed up. Samantha, as mentioned above, thought that apples and oranges were vegetables. She also had a faulty idea about how potatoes grow. Her reply was, "Garden. Put seeds and they grow bigger." She had no knowledge about planting seed potatoes instead of seeds. Along with misinformation, she seemed to have a hard

time articulating her answers in standard English usage.

Fantasy

Josh talked of poking strawberries to see if they are ripe at his other grandmother's house. The only trouble is that there is no other grandmother. He is being raised by his maternal grandmother because his mother is a drug addict who is not involved in his life. He does not know his father or his father's family. He told a lengthy story about having lots of fun strawberry fights with his "little baby," whom he says is three years old. He says the baby throws kind of far with his left hand and always gets him in the face. He just *scwrabbles* the strawberries and then throws them back. When asked if the conversation could be switched to a discussion about potatoes, he sounded relieved. Josh also told an interesting story after he explained what he knew about vegetables:

> And my favorite thing about fruit is like—I used to grow peanut butter. I like peanut butter and jelly and I dump it all in my garden—my grandma's—and that's how it gets all brown and stuff. That's how my vegetables got brown and that's how I really like them.

Josh also told about how his dog runs all over his grandmother's garden and smashes the pumpkins, but "He's a good dog and he loves to play with me."

Josh seemed to be the only one caught up in fantasy. The other children seemed more closely aligned to reality.

Affective Remarks

Adam, upon being asked if he liked vegetables because they would make him big and strong, said, "Because see I like—MMMMM—I like it!" He also said that he liked squash. But

when asked if he liked tomatoes he replied, "No. I hate them! Yuck!!! But I like tacos on tomatoes. I like tacos with tomatoes on them with cheese on it, cutted cheese in little pieces." His feelings about vegetables ran strong.

Josh, in his pleasing mode, mentioned liking pumpkins because he likes to make funny stuff out of them, and other stuff like potatoes. Samantha, when asked if she liked potatoes, said enthusiastically, "Yeah, love, love, love potatoes!"

Information Contrary to Emerging Themes

Some of the information in the pre-experience interviews showed adequate prior knowledge about gardens. For example, Adam knew that one could plant flowers and vegetables in gardens. He knew that vegetables could make one big and strong. He also knew that oranges grow on trees with seeds.

Josh knew that one could tell if strawberries are ripe if they are red. He also knew that his grandmother makes jelly out of them.

Peggy knew quite a bit about potatoes: that they grow in gardens and they have to be watered to make them "get good." She likes mashed potatoes best.

Post-Activity Interview

Scant or Confused Vocabulary

When asked how potatoes grow, Adam answered, "Catsup and seeds." After being reminded about how the potatoes were dug out of a hill with a pitchfork, he remembered that they grew in the dirt on the end of something that he called a plant. But then he said, "Tomatoes grow on the ground—inside the ground." When questioned about whether he knew the difference between tomatoes and potatoes, he said, "Uh, no." The next question concerned tomato products

and he still was very confused about the difference between a tomato and a potato. This is a common problem for young children, however, not just Adam. This will be covered more in the misinformation category.

Adam still thought that the vegetable that pickles were made from was called a pickle. He finally remembered that the name of the vegetable was "cucumber" after a discussion about what had to be done to the vegetable to turn it into a pickle.

Josh seemed confused about the terms "used to like" and "usually like" and used them interchangeably to discuss potatoes: "I usually like them when I was two years old." Asked if he used to like them or he usually likes them, he replied, "I usually like them and all the other stuff. I like zucchini. When I was a baby, I didn't like it, but now I do."

Samantha could not remember the name of the tomato she had eaten after the field experience except to call it, "Cherry—I forgot." When shown a bowlful of cherry tomatoes, she finally remembered what it was. She could only remember *cucumber* when given oral clues by the teacher: "It sounds like a *q*." When asked if she ate sweet pickles, she replied that they were "cut pickles." She also had some interesting names for other garden produce: *squashea, tomawo, and olips.* She thought she had eaten *olips* and pickles. When they have pickles at her house they must also have olives with them.

Loss of Focus

It was Josh who lost his focus in the pre-interviews, but in the post-interviews it was only Adam that kept forgetting the purpose of the interview. When remembering that his grandmother grew corn, he said that she lived in Taylor, but that Taylor was not very far away. After discussing old rotten vegetables that he saw, he said, "I'm thirsty."

When asked about vegetables he had seen in the garden, he said that he had seen a pepper. Then, making connections back to the Word Wall in the class, he announced that pepper starts with the lower case *p* and that it was not included on the Word Wall.

Right in the middle of a discussion about how potatoes grow, he launched into a explanation about how oranges and grapes grow. He correctly stated that oranges grow on trees and grapes grow on vines as if that would make up for his lack of certainty about how potatoes grow. (This was at the point when he was confused about the difference between the terms *potato* and *tomato*.) Then he said, "I've got a cavity!" This was perhaps on his mind, but was totally unrelated to the interview.

Sparse Schemata

Adam knew he had seen flowers in the garden but could not remember what vegetables the blossoms were on even though he had eaten the cucumbers back at school. His discussion about tomatoes and apples will be reported in the next section on misinformation, but it also showed very sparse schemata and confusion about vocabulary.

Samantha was certain that watermelon was a vegetable and that she had eaten it the day before. They did taste other types of melons and had eaten watermelon in class several weeks before when they did Watermelon Math. Her comment on the *olips* and pickles also showed scanty schemata. She forgot that pickles are made from cucumbers and could only remember water as an ingredient in the pickle-making process. When told that you also have to add vinegar she repeated, "Vinegar," and also repeated, "salt," and then repeated, "Spices and sugar and almost everything!" She was anxious to know what was really involved in making pickles.

Peggy said that Mrs. Smith told them what they put into the pickles, but she forgot.

Everything else Peggy said in the post-interview showed a great deal of growth in richness and detail.

Misinformation

Adam showed confusion about vocabulary as well as scarce schemata and misinformation when he talked about tomatoes. He rattled off a list of tomato products that Mrs. Hadley had shown the class: "Catsup, sauce (tomato), tomato soup, apples. Apples are the same thing as potatoes, ain't they?" When asked if he really thought they were the same, he replied, "Yeah, cause they're colored red." But then when asked if they tasted the same, he said, "No." When asked if they grow the same way, he said, "Yeah." He volunteered that apples grow on trees, so he was asked if potatoes grow on trees, and he said emphatically, "No! They grow in the ground." The interviewer then clarified his reasoning—the reason apples and potatoes (tomatoes to him?) are the same is because they are both red. The potatoes in the garden are red potatoes which may have added to his confusion. He then added that apples and oranges both grow the same—they grow on trees. He knew a lot, but it was all in kind of a muddle.

Samantha was certain that she had learned about apples, oranges, and carrots on the garden field trip, but none of them grow in the garden. This generic answer was fine for the pre-interview, but showed misinformation after the experience. As previously stated in the sparse schemata category she thought that watermelon was a vegetable.

Samantha had learned that potatoes grow underground and are hooked onto something, but she thought they were hooked onto stems. When told that stems are above the ground, she guessed, "Leaf!" When reminded that the potatoes are hooked to roots, she chanted, "Yeah, roots—they grow with roots, roots, roots."

Fantasy

Josh showed a tremendous leap in knowledge between the pre-interview and the post-interview, thus reducing his need for fantasy to only one incident. When asked if he or his grandmother have ever made pickles, he said he had made them but his grandmother "don't know how to make them. My dad taught me how." Josh does not know his real father, but calls his Uncle Max his father. It may be that his Uncle Max taught to him to make pickles, but it is unlikely.

Affective Remarks

Adam talked about the old, rotten tomatoes and "smashed yellow squash" which were really old rotten cucumbers. He said, "One of them was cut off and a lot of seeds were coming out—Yuck!" Adam dwelt on the rotten produce a lot.

Josh mentioned that he liked the funny book about *Pickle Things* that Mrs. Smith read. He talked about liking it several times. He also said he likes sweet pickles best.

Information Contrary to Emerging Themes

When he discussed the tomato products, Josh reported that his grandmother has to buy a lot of catsup at the store. Samantha explained that the reason she did not know how potatoes grow was because she was in the very back at the garden and did not get to see. She said, "I halfway saw though. I always sit in the front at school." She is assigned to sit in the front because she is usually quite disruptive.

Depth of Knowledge

Adam knew that corn, tomatoes, cucumbers, and squash all grew in the garden the class visited. He remembered that he saw peppers and "flowers," which were the blossoms on the

plants. He knew that potatoes grow in the dirt at the "end of something" that he called a plant. He remembered that catsup, tomato sauce, and tomato soup are all products made from tomatoes. He also said that pumpkins grow on the ground. All this shows a great increase in background knowledge.

Josh had a tremendous increase in knowledge after the field experiences. He recalled the funny book about pickles and remembered eating tomatoes and three kinds of melons. He remembered tasting pickles and cucumbers and knew that pickles are made out of vinegar, sugar, and cucumbers. When asked what vegetables he had seen he mentioned pumpkins, melons, cucumbers, and squash. He said, "I saw what I saw. That's all I saw in the garden."

When asked how potatoes grow, he said: "You cut up a potato and bury it in the ground and it turns into a root and it grows a whole big of a potato and that's all that I saw." He knew that potatoes grow under the ground and are hooked onto a root. He remembered the tomato drinks and soup and catsup that his grandmother always buys. He was very observant and learned a great deal.

Samantha knew she had seen flowers (blossoms), pumpkins, corn, and how potatoes grow. She also knew that potatoes grow underground and are hooked to something—she was not sure what. She remembered catsup, tomato soup, and tomatoes as being tomato products. She knew that vegetables that are made into pickles are called cucumbers.

Peggy showed a great deal of growth in depth of knowledge. In the pre-interview, she knew nothing about vegetables, tomato products, or pickles. All she knew about gardens was that you can grow bushes and flowers with fruit like apples and oranges. Her prior knowledge was very scanty.

After the field experience she had a lot to say. In the garden she saw pumpkins, potatoes on a root, tomatoes, cucumbers, corn, peppers, and squash. She knew that they were vegetables and that they help you grow up and get strong. She stated that potatoes grow in gardens under the ground and are hooked onto roots. She said there were only two potatoes on the roots and the rest were on the ground. She was being very observant. She remembered the tomato juice, catsup, tomato soup, and tomato sauce. She even volunteered that when her mother makes *pascetti* she makes tomato sauce. When asked what pickles are made out of, she said that they are made out of cucumbers and you put them in a jar with "ummmmm." She was unclear what ingredients go into the jar with the cucumbers, but she did know that sugar was one ingredient.

Appendix D
Garden Journal

Garden Journal

1. Draw the garden.

2. Draw your favorite foods from the garden.

3. Draw how potatoes grow.

4. What things are made from tomatoes?

5. What are pickles made from?

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Appendix E
Garden Language Experience Activity

It started raining. We saw green beans growing. We saw pumpkins. We saw corn. We saw puddles. We saw squash. Mrs. Penner took the pitchfork and dug some potatoes. We saw hot peppers in the garden. We saw the tomatoes. We saw the onions growing. The broccoli was covered with flowers. The melons grow flowers that turn into melons. We tasted cherry tomatoes. Pickles are made from cucumbers. We ate three different kinds of melons. We had fun in the garden.

Appendix F
North Fork Environmental Center Pre/Post Questions

North Fork Environmental Center

1. Tell me what things all animals need in order to live.

2. Tell me what you know about the word habitat.

3. Tell me what you know about the word camouflage.

4. What are the differences between animals who live in the wild and pets?

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Appendix G
North Fork Environmental Center Pre/Post Interviews

The major categories of data for this field experience fell into the same classifications as the garden experience: (a) scant or confused vocabulary, (b) loss of focus, (c) sparse schemata, (d) misinformation, (e) fantasy, (f) affective remarks, (g) information contrary to emerging themes, and (h) depth of knowledge.

Pre-Activity Interview

Scant or Confused Vocabulary

Adam, when asked what all animals need in order to live said, "Eat and drink." He also used the word *wolfs* and instead of saying "and cats too" he said, "any cats too."
Adam could possibly be termed "language disabled" because of his English usage.

Samantha was asked to tell the difference between animals who live out in the wild and pets and her reply was, "A dogs, cats." When asked the question again, she replied, "Bears! You must not go by—bears. Cause they'll eat you full and you'll be inside the bear's tummy." When talking about her pet tarantula she said, "It don't eat—it sometimes eats grasshoppers or that other—you know—I can't remember." She also said, "I don't got any cats." She continued to exhibit a poor grasp of the English language.

Loss of Focus

Josh was talking about being up in the mountains and seeing mountain lions. This could also be categorized in the fantasy section. Following this he started discussing wild snakes and cobras. He then said, "That's all I know about jungles." Somehow he switched from mountains to jungles in the middle of his thought.

Samantha was speaking about lions and tigers and said that they were animals that you must not go by "cause they'll eat ya!" Then she said, "Yeah, bears are way wild." Somehow she got off-track—perhaps because of her conviction that wild animals would eat you if you got too close.

Sparse Schemata

In the pre-trip interview, neither Adam, Samantha, or Peggy had any knowledge about the terms *habitat* or *camouflage*. Josh did not know the term *camouflage* but he did know something about the term *habitat* because of the fact that he went on this trip with the Kindergarten/First-Grade split class last year. He had had previous exposure to these ideas and this seemed to make a difference. His schemata seemed more developed than the other children. He begin filling in with lots of wordy statements again when talking about *habitat*, however. His definition was, "Sometimes it means life." This definition is not too bad, considering that the term is fairly hard to define. When asked what the difference was between pets and animals that live out in the wild, he said that sometimes his grandma tells him, but he did not know.

Misinformation

Adam seemed fairly certain that there were lions, tigers, cheetahs, and leopards in the Northern Utah forest where the trip took place. Interestingly enough, Josh also named the same four animals as animals that live out in the wild. He was not specifically asked if they lived in the forest where the center was. However, when he was asked about animals that might live in the forest he thought that wild snakes and cobras did. Samantha named lions and tigers when she was listing pets, but when asked if they were pets she said, "No!"

Fantasy

Josh reported going up into the mountains and finding a golden rock and seeing mountain lions. It is hard to know if he just found a pretty rock or thought he had really found a gold nugget! He had probably seen the cougar skull and heard the lecture at the Environmental Center about predators, but had probably never seen a cougar in the wild.

Affective Remarks

Adam was talking about cats and said fondly, "You gotta see Simba though, man." He told how Simba ran away from them but now has a new home because they found him. Josh talked about all the things up in the mountains that he likes to see, as if to say that even though he had been there before he still wanted to be able to go again on this trip.

Information Contrary to Emerging Themes

When Adam was asked the difference between wild animals and pets he misunderstood the term "wild animals" and took it to mean "wild pets". It should have been stated differently, such as, "Tell me the difference between pets and animals that live in the wild." That was the way the question was asked of the other children. However, this is what he said: "Wild animals—they chew up newspapers. Wild animals come inside and go running off and go right on you and pets—and they go—when you have food—and they just want the food!"

Peggy began discussing her two dogs, but then lost her focus on pets and provided information contrary to emerging themes. She started talking about the next-door-neighbor's big dogs (they had two). This somehow led into a story about how her dog Jasmine was killed by having her chain pulled by the neighbors. This led to another story about Bear (another of her dogs?) who was killed by "a car, a lady. She was driving a truck with four kids in the back and

she told my Mom." Lots of details incoherently put together, but in her mind all related to the subject of pets and the loss of some of her pets.

Depth of Knowledge

Adam knew that animals need water, and also "eat and drink" as he calls it. He also knew that in the forest where we were going there could be bears, *wolfs*, coyotes, and cougars.

Josh already knew that animals need water, food, and air because he went to the North Fork Environmental Center last year. When quizzed about *habitat* is said that it means life. He knew that mountain lions live up in the mountains, as do also snakes. When asked about pets, replied, "Like cats, baby snakes, like a little dog, and a rabbit."

Samantha figured out that all animals need trees to survive. They also need food, drinks, and "trees for air—that's what we need. I know what we need." When asked about pets she mentioned dogs, cats, and her female pet tarantula. She said that she has two dogs.

Peggy knew that animals need food and water. When asked about wild animals that might live in the forest she mentioned bears and rabbits. She listed dogs, birds, and cats when asked about pets. She described her two dogs named Molly and Fenwick. Molly is black and little.

Post-Activity Interviews

Scant or Confused Vocabulary

Adam was asked what his habitat would be if he were a monkey and he replied, *"Swinking*—I seen a gorilla that was jumped right on the window before with a rope—jumped right on the window!" He also used the word *theirself.*

Loss of Focus

After discussing camouflage, Adam was talking about the Thicket Game where the children hide in the brush. Then he said, "Do you know what I saw up there? Dang dog!"

In answer to the question, "What is the difference between wild animals and pets?" Samantha said that she had two dogs. Answering a direct question seemed difficult for her. Her answer was often a one or two word reply that did not particularly hook to the question. Perhaps this was not loss of focus exactly, but she did seem to have a difficult time remembering what the question was. Instead she concentrated on just one piece of the question.

Samantha was obviously hungry during her post-interview. While discussing how wild animals have to find their own food, she suddenly wanted to know what they were going to have for school lunch in the cafeteria.

Sparse Schemata

In Adam's mind, the animals were divided into the "nice" animals and the "bad" animals. Perhaps he meant that the predators—he named cougars and tigers—are "bad" animals. The "nice" animals to him are the ones that the predators prey on and eat. He focused a lot on animals being eaten.

Samantha was discussing various habitats such as monkeys that live in the jungle. When asked where lions live, she said that they live in the zoo. Although this is true, she missed the idea of their natural habitat. When prodded further and asked if they live in Africa, she said, "Africa, I meant."

Misinformation

There was just one little piece of misinformation in all of the post-interviews. Samantha

seemed certain that monkeys live in the forest. When asked if there are monkeys in Utah forests, she emphatically said, "No!" Perhaps she was confusing forest habitat for that of the jungle.

Fantasy

There was also very little fantasizing in the post-interviews. Adam remembered that he had seen the skulls of tigers, lions, and snakes in addition to the real skulls that were shown to the children. Josh stated that he had gone to Mexico where he saw a tiger.

Affective Remarks

Adam was discussing camouflage and what the animals were trying to do. Instead of saying that they are trying to hide he said that they are trying to "eat you!" When asked about the difference between wild animals and pets he said that dogs lick you too much when they are happy. He had an interesting way of answering questions that did not quite cover the question asked.

Samantha was talking about the Thicket Game. She said, "I like—they can't see where my hiding spots are. You know that big tree? I hided under it, and I hided behind it!" She seemed very proud that no one ever found her. Peggy also said that she never got caught hiding behind a log.

Information Contrary to Emerging Themes

Adam, in the midst of talking about camouflage, brought up the subject of "cougars and tigers and all the bad animals." In discussing wild animals and pets, he said that his father used to have a snake that was nice.

Josh was talking about how wild animals have to find their own food when he suddenly inserted a story about how his grandmother (his step-grandmother) adopted a dog that she had to

take to the pound to get killed.

Samantha mentioned that she only found six colored toothpicks hidden in the grass during the camouflage game because they were easy to see in the grass. If they had been so easy to find, she should have found more than six.

Peggy was discussing feeding and watering pets as some of her chores. She completed the list by saying that she also had to clean the front room and do the dishes. It was hard to get her started talking, but when she finally opened up she was difficult to get stopped.

Depth of Knowledge

All of the children exhibited a much greater depth of knowledge in the post-interviews than they had shown in the pre-interviews. Again, it was Josh and Peggy that showed the most growth. Adam and Samantha had a difficult time answering direct questions. This may have been due to a language disability or it may show more scant schemata than the other children. It was difficult to tell.

All of the four children knew what all animals need: food, water, and shelter. They knew this because of the repeated turns they had when playing the game "Oh Deer."

They all seemed to have a fairly good grasp of what habitat meant, but only Peggy defined it as the center's director had: "everything around you." Josh still defined it as "life and like trees and other stuff." Adam knew it was food and water. He later mentioned shelter. They almost all got the question correct about what kind of habitat rattlesnakes, bears, monkeys, and lions lived in.

In discussing camouflage, they seemed to know that animals have to hide from other animals that are trying to eat them. Josh was relieved that the big animals do not generally eat

people. They could relate to how the animals hide because of the Thicket Game that they played.

In discussing wild animals, Adam knew that he had seen the skulls of cougars, deer, elk, birds, and raccoons. He also added alligators. They knew that wild animals have to find their own food and if they cannot find any then they will die. They also knew that people provide food for their pets. Josh said that you can buy pets at the pet store and then you have to take care of them. Samantha knew the difference between her two dogs and wild dogs in Africa. She said that the wild dogs have to "catch food *theirselfs*." Peggy mentioned that her mother and father make a chore chart that has feeding and watering the dogs on it as chores to do.

Appendix H
Environmental Center Journal

North Fork Environmental Center Journal

1. Draw and write about 3 things all animals need to survive.

2. Draw the habitat of the mountains of the center.

3. Draw an animal using camouflage.

4. Draw 3 wild animals and 3 pets.

Appendix I
Environmental Center Language Experience Activity

We drove on the bus to the mountains. The leaves were changing colors. We saw pretty leaves. There was a waterfall in the canyon. The bus drove over Pineview Dam. We walked up the hill to the center. Mr. Dickens taught us about skulls and antlers. In the forest, we played the game "Oh Deer." We learned that animals need food, water, and shelter. We made Leaf People. They had crayons there. Mrs. Smith taught us camouflage on the bridge. She hid toothpicks on the forest floor. Three people were stung by bees at lunch. The "cougars" tried to catch us in the Thicket Game. We jumped over water on the hike. When we were walking we saw grasshoppers. On the way back to the bus we saw acorns.

Appendix J
Hill Air Force Base Museum Pre/Post Questions

Hill Air Force Base Museum

1. How do airplanes fly?

2. How do they stay up in the air?

3. Why do people have wars?

4. Why do they drop bombs on other people in other countries?

5. What do you have to know to fly an airplane?

Appendix K
Hill Air Force Base Museum Pre/Post Interviews

In the field experience at the Hill Air Force Base Museum, the same categories were generated by the pre and post-trip interviews as in the other two field experiences: (a) scant or confused vocabulary, (b) loss of focus, (c) sparse schemata, (d) misinformation, (e) fantasy, (f) affective remarks, (g) information contrary to emerging themes, and (h) depth of knowledge.

Pre-Trip Interviews

Scant or Confused Vocabulary

Josh was discussing how planes stay up in the air and he attributed it to "those little things inside that are called *pistils*." He defined them as the things that make planes lift off of the ground. Then he said they were "little pit things that are tiny that make them move off the ground." Josh often used the word *gots* instead of *has*. He described bombs as "those big fat things."

Samantha was trying to find the words to tell why nations might drop bombs on other countries. She said, "Cause they try to take their world too and they got their world and they want over the mountains again to their world." It was difficult to tell what she meant by this. She had a hard time expressing her ideas.

Loss of Focus

When the interview started Samantha seemed unaware of the class plans to go to Hill Air Force Base Museum. She is so often tardy or absent that it would not be surprising if she missed the announcement of the upcoming trip. However, if she does know that the class will be going somewhere, she is right on time that day! Her sister is the same way. They never miss a field trip. After she said she did not know how airplanes stay up in the sky, she said, "Are we going to

leave?" When told that the class was going to Hill Air Force Base on Friday, she wanted to know how many more days it was until Friday. She was told that it was in four more days. Then she said, "In five more days I'm going to a Halloween birthday party." This could also have been categorized as information contrary to emerging themes.

Sparse Schemata

When asked why he thought that nations bomb other countries, Adam said it was "cause they moved the houses around and with the truck." In addition to showing sparse schemata, this comment also shows confusion about language usage.

When asked why nations go to war, Adam got everything totally mixed up. It is easy to see how he could have been confused, because in addition to learning all about airplanes and war, it was Ribbon Week where the focus of the school had been on drugs and violence. This was his reply about the cause of war: "Cause we're having drugs. My Mom drinks beer, I think. She eats drugs—maybe she's a drug addict." When assured that she probably was not a drug addict he said, "I don't know." The teacher then talked about a different kind of war than the war on drugs—a war where one country fights another country. Adam said, "My Mom does fight too. Big fights." When asked to clarify his answer, he said, "Yeah, with that man named Jim. Do you know what that man did? Do you know what he gave my Mom for Christmas? Junk!" This conversation could also be categorized under loss of focus, misinformation, or information contrary to emerging themes. It seems to fit best under sparse schemata, however, because he clearly had no idea what war was really about.

Josh thought that bombs get dropped because somebody is trying to shoot a pistol or a BB gun. He was certain that such an incident could start a war.

When asked how airplanes fly or how they stay up after they are in the air, Samantha had no idea. Certainly her answer shown above about why nations drop bombs showed sparse schemata. She had a vague idea about taking over someone else's world, but that is all.

Peggy did not know much more except that airplanes fly with their wings. When asked if they flap their wings like a bird, she laughed and said, "No!" She thought that they just held them out to fly. Peggy also did not know how planes stay up in the air, why nations drop bombs, or how long it takes to learn to fly an airplane. Her prior knowledge was very sparse and in some cases there was no schemata development at all.

Misinformation

Adam's thoughts on his mother being a drug addict were a clear case of misinformation. His mother had been having a lot of trouble with kidney stones and had probably been taking medication. It would be interesting to know how many children think their parents are drug addicts when they take doctor's prescriptions or over-the-counter medications.

Fantasy

Josh seemed certain that he or his "dad" owned a rocket gun or rocket launcher. This was his only lapse into fantasy in the pre-trip interview. None of the other children had any answers in this category.

Affective Remarks

Nothing was said in the pre-trip interviews about how the children felt unless Adam's unspoken worries about having a drug addict, beer-drinking, fighting mother would count here. He did seem worried about all of this because it was Ribbon Week and the focus was on remaining drug and violence free. First-grade children often worry when their parents smoke or

drink or do drugs when the focus is on not participating in any of those kind of activities.

Information Contrary to Emerging Themes

As mentioned previously, Adam's conversation about war and Samantha's discussion about how many more days until the field experience both could also be placed in this category. They did not answer the questions posed to them, but branched out in other directions.

Depth of Knowledge

There was a fair amount of prior knowledge shown in the pre-trip interviews. Adam must have watched some movies about war because he knew that, "The people turn on the airplanes and they put the controls and they put them back and then they fly." He knew that they stay up in the air when the controls are back. When landing an airplane he knew that the controls had to be pushed back where they were before.

Josh knew that airplanes fly with motors and wings. "And they also won't move off the ground if they don't have a pilot. If there's no steering thing, they'd crash." He thought the heavy motors help keep them up in the air. His reason for war was "if they get in a fight they might want to have a war or something with their planes."

Josh felt that a war could be started with a pistol, BB gun, a sniper or a rocket launcher. Then "they'll drop one of those big fat things down on their city." He reasoned that they might just drop a tiny parachute bomb instead. He knew that the big bombs "drop down real fast and blow the air."

He thought that in order to fly an airplane you would have to know all the shifts and buttons. You would also have to be in college. If you did not know how to fly the plane, you would be pushing all the wrong buttons and all the bombs would drop out!

Samantha said she knew why people go to war. "Cause they want to kill people that wants to take their world." In order to fly planes she said you would have to know all the stuff you could touch and what button to push to go down very slowly or you would crash.

Peggy said the reason that people have wars is because they are different. She also said another reason is because they want to.

Post-Trip Interview

Scant or Confused Vocabulary

Adam said, "I like this cool airplane that flies higher than this airplane that goes faster than anything and the back has three wheels." This is another example of his interesting sentence structure. He was speaking of the Blackbird spy plane and he had all the details intact, but it was a little hard to understand him.

When asked why nations have wars he said, "Cause they make them not to shoot." He was asked what you would have to learn before you could fly a plane and his answer was simply, "Read."

Josh used the word *igerant* several times when explaining why people start wars. He seemed confused about whether the bombs in the museum were armed or not. He said that we should give all our bombs to Hill Air Force Base Museum, but they might blow up. When told that they were not armed and dangerous, he said he knew that. Several times he referred to the *matomic* bombs.

Peggy had a different word for describing the lift that helps an airplane fly. She said when the lift is *badder* than the gravity, instead of greater than the gravity, then it will fly. This word comes up quite often when talking with first-graders.

Loss of Focus

After answering the question about how planes stay in the air, Adam launched into a long explanation about airplanes he had seen on TV on a "very cool show" where soldiers have masks on. Then there is this "cool thing" that is just like a toy that opens up and has a "very slimy guy in there. He is in jail. And he pinches too with these very sharp claws on and they pinch like this." At this point, Adam made some interesting noises that sounded like, "Yike, yike!" as he made pinching motions with his hands. In his mind it all had something to do with the airplanes he had seen at the museum.

When talking about the reasons for war, Adam knew that it was just like a fight between friends, except on a bigger scale. After talking about how he and his friend fight and then make up, he told about how his friend let him ride his racecar bike. This led to the loosely related comment that his costume for Halloween was going to be a racecar driver. Perhaps because Halloween was less than a week away it was on his mind. This story could also have been classified as information contrary to emerging themes.

Sparse Schemata

Adam's comments about the cause of war, "Cause they make them not shoot", seems to represent a beginning schemata about disarmament. The class had been discussing how the arms race had escalated to a ridiculous level and then tapered off with the larger nations slowly trying to dispose of their nuclear weapons. The discussion also included the fact that some smaller nations now had nuclear weapons and the United States was not quite sure how they intended to use them. Both of the boys seemed most interested in this information.

When he was asked about the amount of training it takes to become an Air Force jet pilot,

Adam stated that they have to go to school for sixty minutes. He was also sure that it did not take any practice to learn to fly. The only sparse schemata comment that Josh made was also in regard to the time it takes the pilots to train. His estimate was just the opposite—he said they have to stay in school for "like twenty-five years or eighty-five!" He knew you could not just get into a jet a fly it right away. First-graders seem to have no concept of time.

The retired Air Force jet pilot that talked to the children before they toured the museum had told them that it costs the Air Force $1,000,000 to train a fighter pilot. Samantha must have missed this comment, because she had no idea how much it would cost.

Fantasy

Adam's comments about the "very slimy guy" with the claws that pinch was an exercise in fantasy. However, he probably did see a TV program with such a character.

Josh had been discussing what you need to know in order to fly an airplane when he launched into the following:

> My dad's teaching me how to fly in my little airplane that he's going to build with little tiny pretend bombs. But they don't really shoot. I like riding in it cause there's just wheels on it and it lifts upa little cause my dad lifts me up on it.

Misinformation

Samantha knew a lot about what it would take to fly airplanes. She said that you would have to know which buttons to push, but when asked if that would be easy to learn she said, "Yes." However, right after that comment she said it would take "Years, months; lot of months and years" to learn to fly a plane. Josh's comment that you would have to learn about flying for twenty-five or eighty-five years also could be categorized as misinformation, along with Adam's

guess of sixty minutes.

Affective Remarks

Adam seemed so confident in his knowledge about pulling the controls back to fly a plane that the researcher said, "I think you are right." He replied proudly, "I am!" It was not hard to feel his great interest in the Blackbird spy plane when he described "this cool airplane." In his conversation about how his friend lets him ride his bike after they fight and make up, he said with obvious affection, "I love my friend. Do you know why? He lets me ride his bike sometimes. It's a racecar one too."

Josh told how much he really liked it when his dad lifts him up in his little airplane—the one with tiny pretend bombs. Even though the whole story was a fabrication and he has no father, one could almost feel how much he would like to have had such an experience.

Josh was very concerned about disarmament and whether Americans can trust all other nations to also disarm as they have promised to do. He imagined the enemy saying, "You want to get rid of your bombs and I'll get rid of mine." And then if they trick "that's *igerant"* to other people. He said we might die if others trick us, so he thinks we might want to keep our bombs too. His other suggestion was to give all the bombs to Hill Air Force Base Museum. Then he went into quite a lengthy, confusing explanation about what would happen if we were just tricking each other back and forth. He decided that we might blow up! Perhaps war with all its ugly ramifications is too heavy a subject for first-graders. However, it is difficult to go Hill Air Force Base Museum without understanding why there are so many bombs there and having some background to help understand the big picture of national defense.

Information Contrary to Emerging Themes

Adam's story about the "cool" airplane show on TV could have been classified in this category. Samantha had been discussing why nations drop bombs on other nations. She knew that it might be because they want to take over someone else's land and that sometimes it is done to preserve freedom. She was told that no one had ever come onto American soil to try to take over our land. The following was her reply:

> If they try to get Tremonton just because the cops are stupid up there. My Aunt Mindy lives up there. The cops are stupid up there. My Mom knew that. Cause if they speed, the cops won't get them. So you can go as fast as you want. Guess what? One time, when there was cops at my Mom's house, when we got back to my aunt's house, cause my cousin left the door open all the way, my aunt thought cops went into her house.

Samantha's idea of freedom from tyranny differs from that of many first-graders because of the nature of her family life. She often talks about Tremonton as if it were heaven or something close to it. Perhaps she is treated with more respect at her aunt's house or maybe it is just a welcome change of scene from her chaotic household.

Peggy still had her mind on Ribbon Week. She still thought that the reason nations drop bombs on other people is because the other ones like to do drugs.

Depth of Knowledge

After extensive classroom learning on how airplanes fly, all four students could recite the reason: "When the lift is greater than gravity and the thrust is greater than the drag." Actually simulating these movements with body language helped them understand these natural physical

laws. Josh called the thrust *push*, but it meant the same thing. They all learned that lesson well.

The girls both knew that the lift and thrust that get the airplane up also keep it up in the air. The boys had some different ideas that were more technical. Adam still maintained that, "When they push the controls up, they stay up in the air." Josh expanded on the lift and thrust idea:

> The thing that helps them stay up is almost like the motor but it's actually when they go on a runway the gravity then, the lift just pulls them up and gravity then brings them back down. The lift is pulling harder than the gravity.

Adam and Josh's ideas about why we have wars have already been shared in other sections. They seemed to have quite extensive grasps of the subject. Samantha just said that others want their land. In talking about it like a fight between two people only bigger, she said, "It's huge!" Peggy thought it was because the two countries are so different. Both Adam and Josh thought that bombs get dropped because someone starts shooting guns at them, so they drop the bombs on the people. Josh expanded on that idea:

> Cause they might fight and they might drop bombs and when they get in a fight with guns or bombs, well if they don't care and they say, Just kill me! Just kill me! I don't care. And they say, Okay. And they're not going to kill you, but you just head right straight up with them with a atomic bomb and they don't have nothing but their airplane and they're just driving around taking pictures. They would die with the *matomic* bomb, the *matomic* bomb launcher.

They all seemed to know that learning to be a pilot would take a long time.

Appendix L
Hill Air Force Base Journal

Hill Air Force Base Museum Journal

1. Draw your favorite big airplane.

2. Draw your favorite little aircraft.

3. Draw the bombs and missiles.

4. Write about why we bomb other people.

Appendix M
Hill Air Force Base Language Experience Activity

In the classroom, we learned about planes. We learned that bombs drop and blow up. Smart bombs don't blow up until they find their target. We saw big and little airplanes. We saw fat cargo planes. We saw big and little jets. The atomic bomb is fat and terrible. We saw helicopters. We saw F-16's landing. A = Attack B = Bomber C = Cargo F = Fighter